Sea Grant

Texas Sea Grant College Program

Strategic Plan

2009-2013

June 2008

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Coastal Science Serving Texans

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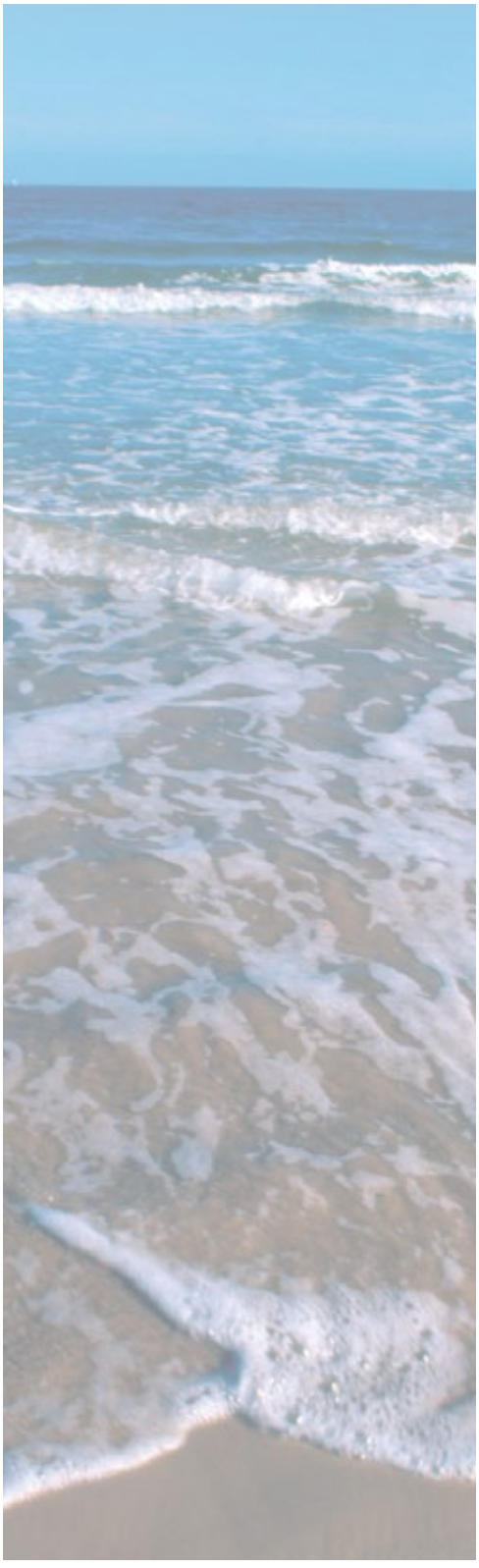


Executive Summary

The mission of Texas Sea Grant is to develop a better understanding of Texas coastal resources through research, outreach and educational programs in support of the sustainable use and conservation of those resources for the benefit of the economy and environment.

The Texas Sea Grant College Program is one of 31 programs in the Sea Grant network. Texas Sea Grant is supported by the National Oceanic and Atmospheric Administration (NOAA), the Texas Legislature and Texas A&M University. With its headquarters in College Station, Texas Sea Grant supports marine-related research at universities across the state through a competitive grant program, has a cadre of Texas Sea Grant Extension agents and specialists located primarily along the coast, and produces educational materials through its communications arm, the Marine Information Service (MIS).

This strategic plan was developed through a process that included conducting a survey of attendees at the Houston Boat Show in January 2006 and an email survey of stakeholders that was conducted from January through March. Those surveys were followed by a meeting of the Texas Sea Grant Advisory Committee in June that was also attended by representatives from Texas Sea Grant Extension and from MIS. Research priorities and several specific research topics were developed during the meeting. As the strategic plan was developed by Sea Grant staff, it was aligned with various other strategic plans within NOAA and with the Texas A&M University strategic plan, *Vision 2020*. The recommendations from various commissions and other groups that have recently addressed marine research and/or ocean policy were also consulted and the applicable ones were used to help guide development of this document.

Drafts of this strategic plan were distributed to the Sea Grant professional staff and the Advisory Committee with the request that the recipients disseminate it further among their colleagues and stakeholders. That process was completed in October 2006. The comments and suggestions received were incorporated into a second draft, which was then sent to Dr. John Byrne, who has extensive strategic planning experience, and his comments were incorporated into the final draft of the document. The plan was completed in November with a 2007-2011 time frame. It was posted on the Texas Sea Grant website: http://texas-sea-grant.tamu.edu.

The conceptual framework for the *NOAA National Sea Grant College Program Strategic Plan 2009-2013: Meeting the Challenge* was discussed at a meeting of the Sea Grant Association in San Diego, California, in October 2007. Based upon the discussion, the National Strategic Plan was drafted and released for comment in December. The Texas Sea Grant plan was revised to align with the draft of the National Strategic Plan; the dates of the Texas plan were later modified to 2009-2013 and additional edits were made to reflect the cross-cutting goals and focus areas of the National Strategic Plan after its final release in April 2008.

During the period covered by this strategic plan, Texas Sea Grant will continue its research foci in the following areas:

1. Coastal communities and economies.
2. Coastal ecosystem health.
3. Marine education.

The National Sea Grant College Program Strategic Plan has four focus areas:

1. Healthy coastal ecosystems.
2. Sustainable coastal development.
3. Safe and sustainable seafood supply.
4. Hazard resilience in coastal communities.

The National Strategic Plan also has three cross-cutting goals:

1. Sound scientific information to advance understanding of the nature and value of our coastal, ocean, and Great Lakes resources; to identify new ways to conserve and use these resources; and to support evaluation of the environmental impacts and socio-economic trade-offs involved in coastal decision-making.
2. An informed public that understands the value and vulnerability of coastal, ocean, and Great Lakes resources, and demands informed science-based decisions about the conservation, use, and management of these resources, and a well-trained workforce that will make this a reality.
3. Decision-making processes that involve the full range of coastal interests, that integrate efforts of public and private partners at the federal, regional, state, and local levels, and provide mechanisms for establishing common understandings and generating outcomes that balance multiple interests.

Texas Sea Grant supports and shares each of these goals. All three are embedded within the research, outreach and communications activities that are undertaken by the program.

While the verbiage and number of focus areas differ between the two plans, all the focus areas within the National Strategic Plan have counterparts in the Texas plan. The strategic objectives and specific strategies in the Texas plan are primarily state and regional issues, while the NSGO plan is national in scope. This does not mean that problems addressed by Texas Sea Grant are not of interest nationally, as many of them certainly are.

A group of strategies has been developed under each objective.

The strategic objectives of Texas Sea Grant for the period 2009-2013 are:

1. Addressing Critical Issues
2. Enhancing Products and Resources
3. Engaging Stakeholders
4. Extending Our Reach

In the area of addressing critical issues, Texas Sea Grant is interested in:

1. Developing technologies required for the production of new species for enhancement stocking and commercial aquaculture in the open ocean with an emphasis on maintaining environmental quality,
2. Developing resilient, well-planned, thriving and sustainable coastal communities through studies of socio-ecological processes and innovative approaches to planning and management,
3. Participating in the development of the Gulf Coastal Ocean Observing System,
4. Developing informational materials on Texas coastal ecosystems and their non-market value, and supporting research to improve ecosystem-based management of fisheries and promote sustainability of the fishing industry,
5. Increasing the volume while maintaining the quality of coastal and marine science information made available to the public, K-12 schools and the higher education community,
6. Resolving issues related to red and brown tides, invasive species and oyster diseases, and
7. Improving the quality of Texas seafood and the fuel efficiency of seafood harvesting enterprises.

With respect to enhancing products and resources, the program will work toward:

1. Expanding the print run and readership of *Texas Shores* magazine and redesigning its appearance and format,
2. Developing an endowment for a Sea Grant chair at Texas A&M University, and
3. Obtaining additional funding support for Sea Grant activities from new sources.

Sea Grant needs to constantly engage its stakeholders and expand upon the membership of the stakeholder community served by the program. Addressing that priority will involve:

1. Demonstrating the effectiveness of linking university researchers with state agencies,
2. Engaging the U.S. Weather Bureau and the emergency management community in selected coastal communities, and
3. Developing new programs and expanding upon such existing programs as coastal community development, Clean Marinas and rip current awareness.

Finally, we will extend our reach through:

1. Developing regional research activities with colleagues in the other three Gulf Sea Grant programs, and
2. Developing collaborative projects with Sea Grant programs outside of the Gulf of Mexico region.

Vision Statement

The vision of the Texas Sea Grant College Program is to achieve the highest level of excellence, integrity and leadership in addressing issues and solving problems related to the natural environment, coastal communities and the economy of the state. In bringing this vision to reality, Texas Sea Grant will also be making positive contributions to the region, nation and world.

Mission Statement

Texas Sea Grant's mission is to develop a better understanding of Texas coastal resources through research, outreach and educational programs in support of sustainable use and conservation of those resources for the benefit of the economy and environment. Texas Sea Grant exists as one of 31 university-based programs funded by the National Oceanic and Atmospheric Administration (NOAA) to implement the agency's overarching mission by enlisting the academic research community, engaging coastal communities and providing marine education to all age groups. The Texas Sea Grant mission is most simply stated in our motto: *Coastal Science Serving Texans.*

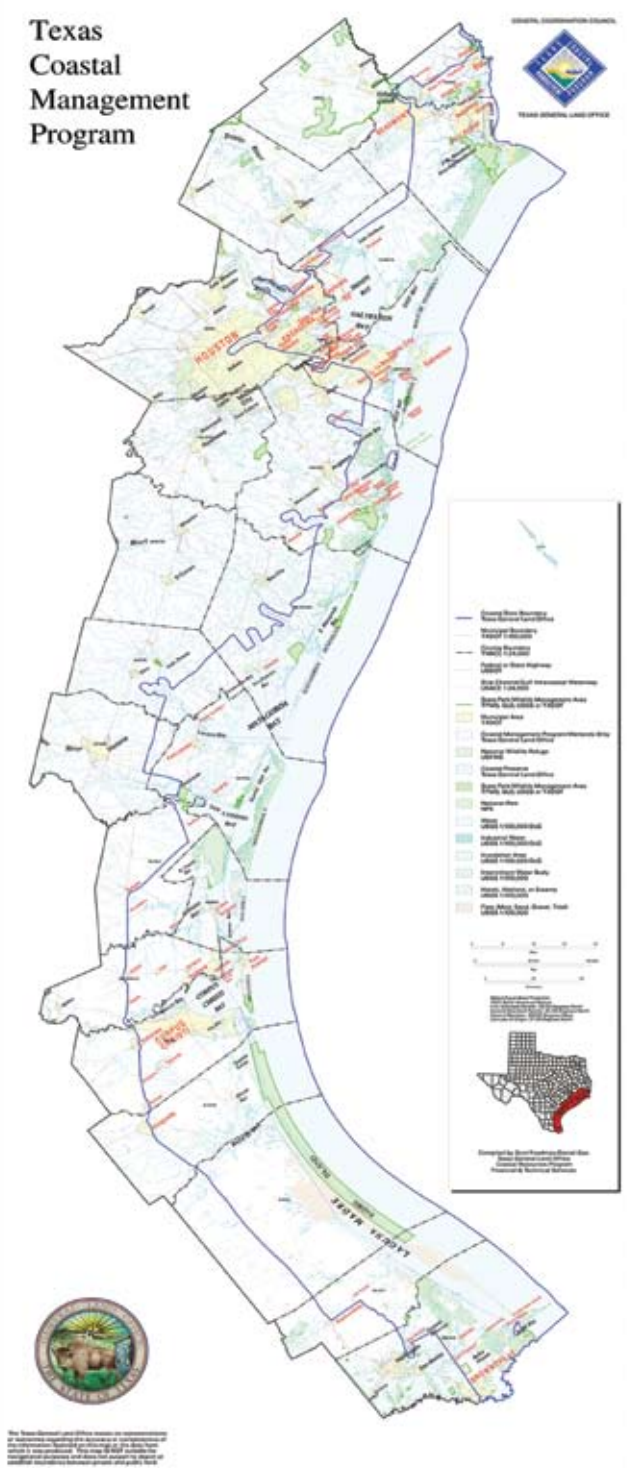


Figure 1. The counties and portions of counties in Texas that are considered coastal as defined under the Texas Coastal Management Program.

Introduction

Setting

As of the last census, the population of Texas stood at 22 million, and it was projected that growth will add 5.8 million new Texans by 2010. Many of those new residents can be expected to select one of the coastal counties adjacent to the Gulf of Mexico and/or the Texas coastal bays and estuaries (Figure 1). Currently, the Houston-Galveston-Beaumont area is home to more than 3.5 million people and represents the population center of the upper Texas coast.

Corpus Christi is the population center on the middle coast, with over 275,000 residents (well over 300,000 live in Nueces County). Cameron County in South Texas borders Mexico and is the location of the next major coastal population center, which includes the small community of South Padre Island (population 2,200) and the neighboring inland cities of Brownsville (population 156,000) and Harlingen (population 66,500). Between Corpus Christi in Nueces County and Harlingen in Cameron County there are three counties bordering the Gulf of Mexico that have very small populations, mainly because they are the locations of large ranches. That situation may change in the future as ranch land is sold to developers, as is currently happening along the coast in Calhoun County north of Corpus Christi.

Texas is home to some 250 petrochemical plants, 26 oil refineries and 74 gas processing plants. Liquid natural gas terminals are planned for at least two sites offshore and one onshore. Wind farms are also being designed for Texas coastal waters.

The Gulf Intracoastal Waterway is a major transportation corridor for barge traffic transiting the state. Texas has 13 deep-draft and 16 shallow-draft ports, with the Port of Houston being the largest in the state and the top port in the nation with respect to total foreign trade.

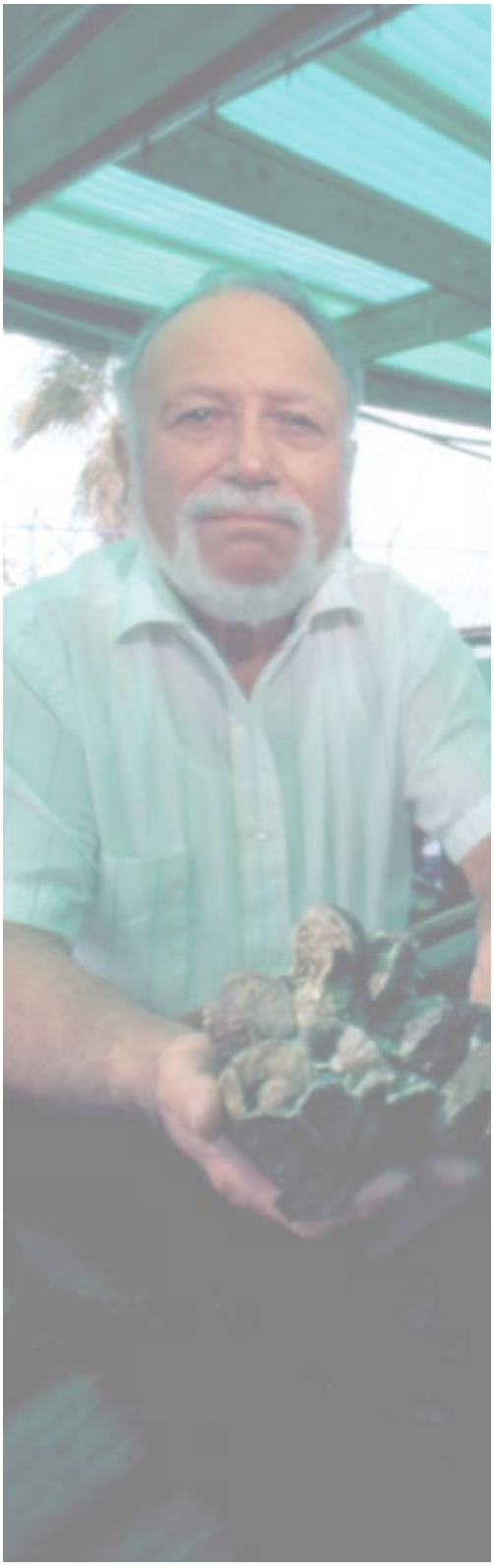
The pressures of continued development in already densely populated areas, and the rapid expansion of development in coastal areas that were until recently home to only cattle, cowboys and wildlife, place ever-increasing pressure on coastal natural resources and threaten the quality of life for humans. The threat of a severe hurricane of the kind that devastated the Mississippi and Louisiana coasts in 2005 adds to the likelihood of damage to coastal natural resources and the quality of life. Programs like Texas Sea Grant that support research and engage with state and local decision makers to promote resilient and sustainable coastal communities are critical in helping reduce the risks faced by communities and ecosystems.

Background on the Program

Texas A&M University was among the first four institutions in the nation to achieve Sea Grant College status in 1971 under the National Sea Grant College Program Act of 1966. In the more than 35 years since being named a Sea Grant College Program, Texas Sea Grant has supported applied research at various institutions of higher education in the state through a competitive grant process. Furthermore, Texas Sea Grant Extension, which is fully integrated into the program, provides outreach through a cadre of coastal and marine resource agents and specialists. Seven agents serve the needs of stakeholders in eight coastal counties, while our seven specialists focus on the thematic areas of aquaculture, coastal community development, environmental quality, fisheries, marine business, marine education and seafood. All agents and all but two specialists are strategically located along the coast. Texas Sea Grant Extension is led by an Associate Director who is based in College Station.

The Marine Information Service, working in close collaboration with Texas Sea Grant Extension and in frequent contact with researchers supported by the program, publishes the award-winning *Texas Shores* magazine, news releases, books, brochures, fact sheets, annual reports, pamphlets, posters and curriculum materials along with producing CD-ROMs, DVDs, maps and other products. Sea Grant Extension personnel work directly with K-12 schools both individually and collectively through the Floating Classroom Program.

Requests for research proposals are distributed broadly to a continuously updated list of potential investigators every two years. A Sea Grant Advisory Committee comprised of academicians, state and federal agency personnel, and representatives from nongovernmental organizations and marine-related businesses and industries help Sea Grant establish its research priorities for each cycle. Those priority areas also provide guidance for the extension and communication arms of the program, though the activities of those groups extend well beyond interpretation and dissemination of research information generated by Texas researchers. Extension and communications personnel seek out information from virtually any source located anywhere in the world, as long as that information is reliable, scientifically sound and relevant to the stakeholders that the program serves. In addition to adopting the priorities established by the Advisory Committee, Texas Sea Grant solicits and attempts to fund at least one marine education proposal during each cycle and reserves the right to fund proposals that are not associated with current priorities but that hold the potential for making significant contributions to solving important problems. Sea Grant also tries to retain a small amount of funding in reserve for small program development grants.



The Planning Process

This strategic plan was developed during 2006 through 2008 for implementation starting in 2009, and a draft was released at about the same time that the request for pre-proposals for the February 1, 2008, through February 28, 2010, cycle was made available on the Texas Sea Grant website: http://texas-sea-grant.tamu.edu.

The process of developing the Texas Sea Grant Strategic Plan began in January 2006, when survey cards were distributed at the Houston International Boat Show to gauge public opinion on topics considered to be important coastal issues. One hundred cards were returned (Table 1, below). Also in January, a survey that lists the 11 theme areas that were developed by the Sea Grant Association and the National Sea Grant Office (NSGO) was put up on the Texas Sea Grant web site where it remained available until mid-March. Results from that survey are shown in Table 2 (page 9). Information about the web-based survey and invitations to fill it out online were sent to Texas Sea Grant's extensive email listserv and to the Texas Sea Grant Extension advisory board and our agents and specialists with a request that they contact other stakeholders and request that those individuals respond to the survey. About 100 responses were obtained from individuals representing a broad cross-section of society (Table 3, page 10). Many of the issues identified as being important by respondents to the two surveys were common to both groups.

Texas Sea Grant is a university-based program that funds research applicable to marine and coastal issues and then translates the findings to the public, marine-related industries and coastal policymakers. In addition, it publishes a quarterly magazine and other educational materials. With your interest in recreational boating, we would like to know your opinion on what issues are important to the Texas coast. Please take a moment to check those issues that you feel are important. Your information will be used in developing our next five-year plan.

- ☐ Boating safety **46**
- ☐ Coastal hazards (storms, etc.) **35**
- ☐ Freshwater inflows **33**
- ☐ Fisheries **51**
- ☐ Marine education **31**
- ☐ Coastal community development **21**
- ☐ Coastal air quality **21**
- ☐ Economic development **13**
- ☐ Marina operations **15**
- ☐ Coastal pollution **62**
- ☐ Coastal erosion **44**
- ☐ Seafood safety **36**
- ☐ Aquaculture **29**
- ☐ Marine policy **16**
- ☐ Port development **13**
- ☐ Marine debris **32**
- ☐ Nature tourism **19**
- ☐ Watershed restoration **22**

Table 1. Replica of survey card passed out at the Houston Boat Show in January 2006. The numbers in bold indicate how many individuals checked the box next to each topic.

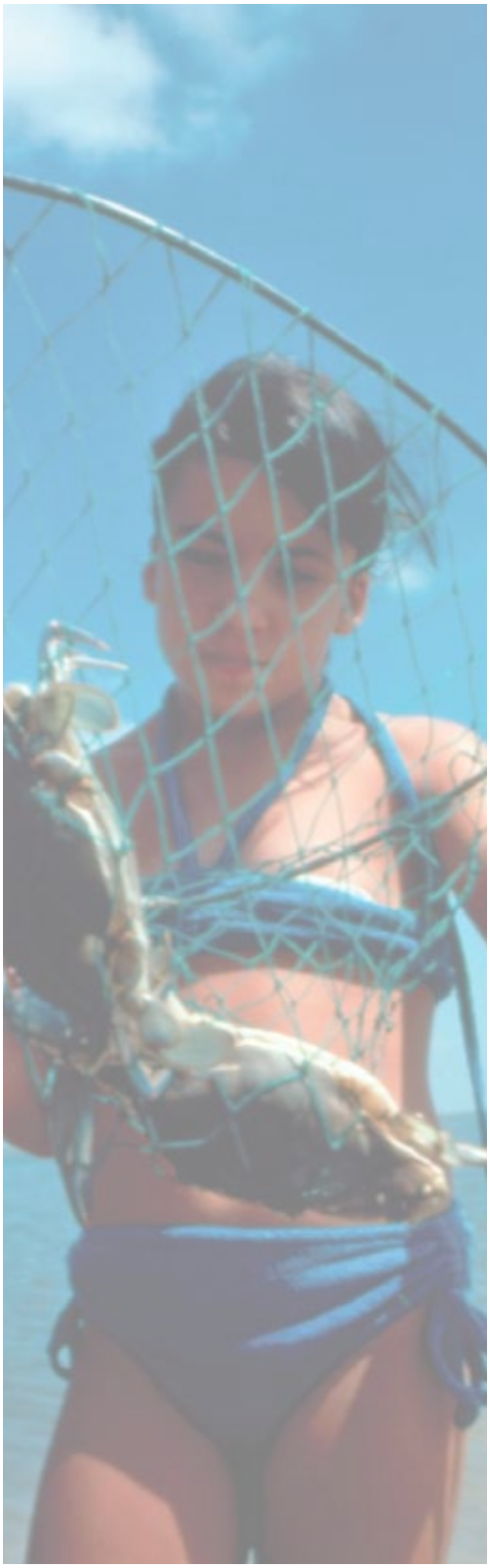
Theme Identification	Priority Level Percentage			Total Responses	Project
	High	Medium	Low	(out of 98)	Suggestions
Coastal communities and economies	54.2	34.4	11.5	52	57
Coastal natural hazards	48.5	35.1	16.5	97	54
The digital ocean	35.4	43.8	20.8	96	49
Ecosystems and habitats	71.9	22.9	5.2	96	58
Fisheries	43.6	41.5	14.9	94	45
Marine aquaculture	38.7	35.5	25.8	93	49
Marine and aquatic science literacy	52.6	34.7	12.6	95	49
Marine biotechnology	33.0	39.4	27.7	94	42
Seafood science and technology	30.2	32.3	37.5	96	33
Urban coasts	51.6	34.7	13.0	95	41
Aquatic invasive species	51.6	32.6	15.8	95	44

Table 2. Priority level placed on each of the 11 Sea Grant themes, number of respondents who rated each theme and number of research project suggestions received for each theme.

In June 2006, the Texas Sea Grant Advisory Committee was convened to develop priorities for the 2007-2010 proposal cycle and to provide input to the strategic planning process. As an outcome of that meeting, Texas Sea Grant was directed to continue to focus the research program as it has in the past few years on 1) coastal communities and economies and 2) coastal ecosystem health. A number of suggestions were made for specific topics that would be appropriate under those two broad categories. Traditionally, Texas Sea Grant has attempted to fund at least one marine education research proposal during each cycle. With the increasing emphasis across the nation on ocean literacy and the strong recommendations from the U.S. Commission on Ocean Policy related to marine education, the advisory committee was asked and gave its approval for continuation of marine education as a priority area and approval was obtained.

Building regional efforts into the strategic planning process was discussed at a meeting of the four Gulf of Mexico Sea Grant program directors and their extension leaders held on July 12 and 13, 2006, in Baton Rouge, Louisiana. Thereafter, the Texas Sea Grant management team took into consideration all stakeholder input and the need to coordinate this strategic plan with the strategic plans of NOAA, the NSGO and Texas A&M University. Recommendations from various sources such as the President's Commission on Ocean Policy were taken into consideration as the team developed the objectives, goals, strategies and metrics that are presented in this document.

The draft strategic plan was sent to the Sea Grant Advisory Committee and Sea Grant Extension agents and specialists in the fall of 2006. Some of the advisory committee members circulated the draft within their agencies, and Texas Sea Grant Extension personnel were



asked once again to circulate the draft among their stakeholders. Once all the input was received and incorporated, the next draft of the plan was sent to Dr. John Byrne, a highly experienced strategic planner, to garner his suggestions. He responded with some excellent suggestions, which were helpful as the draft plan was finalized. The plan was posted on the Texas Sea Grant website in November 2007. That draft covered the period 2007-2011.

Subsequently, the NSGO indicated that a new National Sea Grant College Program Strategic Plan would be drafted during 2007, and once that plan was finalized all 31 Sea Grant Programs would need to align their strategic plans with the national plan. The conceptual framework of the National Strategic Plan was discussed for several hours at a meeting of the Sea Grant Association in San Diego, California, in early October 2007. Dr. Byrne presented the essence of the plan and received input from the assembled group of some 200 individuals before producing a written draft that was distributed within the Sea Grant family in December for comment. As a result, Texas Sea Grant revisited its plan and added language in this draft to demonstrate how the Texas plan aligns with the National Strategic Plan. The time frame for the Texas plan was revised to cover the period 2009-2013, the same period covered by the National Strategic Plan. When the final version of the National Strategic Plan was released in April 2008, the portion of the Texas plan that describes the goals and focus areas of the National Strategic Plan was revised to reflect the changes that had been made to those items.

Respondent identification	Number	Percentage
County officials	1	1.0
Federal agency employees	3	3.1
Interested private citizens	18	18.4
K-12 teachers	1	1.0
Marine business persons	8	8.2
Non-government organization personnel	6	6.1
University researchers	36	36.7
Sea Grant agents and specialists	3	3.1
State agency employees	16	16.3
University administrator	6	6.1
Others*	19	19.4

*Included individuals identifying themselves as: bank president, community college faculty member, city government official, manager of Municipal Management District, municipal planner, regional planning agency personnel, municipal employee, city parks board member, master naturalist, city economic development personnel, port authority personnel, aquaculture producer, manufacturer of aquaculture tanks, aquaculture manager and aquatic feed manufacturer.

Table 3. Affiliations listed by respondents to the survey, the number of each and percentage.

The Strategic Planning Challenge

Texas Sea Grant is based at Texas A&M University and thus has a responsibility to address to the extent possible the imperatives of the university's strategic plan, *Vision 2020*.[1] Since the Texas Sea Grant Strategic Plan for 2002-2005 was published, a number of documents have been produced that needed to be factored into this strategic plan for 2009-2013.[2] NOAA developed its strategic vision *New Priorities for the 21st Century*,[3] the Office of Oceanic and Atmospheric Research strategic plan was published,[4] and the National Sea Grant Office (NSGO) produced its 2003-2008 strategic plan,[5] which was completely revised in 2008.[6] Also of significance was the report of the President's Commission on Ocean Policy, *An Ocean Blueprint for the 21st Century*,[7] which was finalized in 2004. That was followed by the response from the Bush Administration in the *U.S. Ocean Action Plan*,[8] one regional response to which was the establishment of the Gulf of Mexico Alliance, which published a report in 2006 titled *Governors' Action Plan*.[9] Also in 2006, the Joint Ocean Commission, consisting of some members each from the Pew Ocean Commission and the U.S. Commission on Ocean Policy, released a joint initiative, *From Sea to Shining Sea: Priorities for Ocean Policy Reform*.[10] More recently, the Joint Subcommittee on Ocean Science and Technology (JSOST) of the National Science and Technology Council released its draft report, titled *Charting the Course for Ocean Science in the United States: Research Priorities for the Next Decade*,[11] which contains focus areas where Sea Grant can play a role. Finally there was the release of the 2009-2013 NSGO plan as previously discussed.

[1] *http://www.tamu.edu/vision2020/culture/index.php.*

[2] *Revision of the plan did not occur until 2006 because the NSGO suggested postponement of the new plan until the National Sea Grant Strategic Plan had been revised (scheduled for 2006 but delayed as discussed).*

[3] *http://www.noaa.gov/str-plan/planCover.html.*

[4] *http://www.seagrant.noaa.gov/internal/SG/html/Greenbook/gb_documents/pdf_otherfiles/oar_strat_Plan_062703.pdf.*

[5] *http://www.seagrant.noaa.gov/other/greenbook_doc/sg_strategic_plan_082304.pdf.*

[6] *NOAA National Sea Grant College Program Strategic Plan 2009-2013: Meeting the Challenge.*

[7] *http://www.oceancommission.gov/documents/full_color_rpt/welcome.html.*

[8] *http://ocean.ceq.gov/actionplan.pdf.*

[9] *http://www.dep.state.fl.us/gulf/files/files/GulfActionPlan_Final.pdf.*

[10] *Joint Ocean Commission. 2006. From Sea to Shining Sea: Priorities for Ocean Policy Reform. Joint Ocean Commission, Washington, D.C.*

[11] *http://ocean.ceq.gov/about/sup_jsost_public_comment.html.*

In producing this strategic plan for 2009-2013, Texas Sea Grant was dedicated to adopting objectives within the NOAA and NSGO plans that relate to Texas and to looking at the various recommendations from commissions, subcommittees and so forth to identify those to which Texas Sea Grant is in a position to respond.

NOAA's interest in seeing more regional activities conducted by Sea Grant was reinforced by a recommendation in the 2006 report from the National Research Council titled *Evaluation of the Sea Grant Program Review Process*.[12] As a result of that recommendation, discussions among the four Gulf of Mexico Sea Grant directors led to development of a joint request for proposals (RFP) for a regional project toward which each of the programs pledged $50,000 a year for two years during the February 2008-January 2010 proposal cycle.

Features of the various strategic and action plans and other documents that helped guide development of the Texas Sea Grant Strategic Plan for 2009-2013 are described in the Appendix. Clearly, Texas Sea Grant cannot address all relevant aspects of each of the plans and recommendations in the various reports, so the strategic plan for Texas Sea Grant outlines objectives, goals, strategies and programs where the program's greatest strengths lie and where stakeholders have indicated Sea Grant resources should be placed.

[12] *http://newton.nap.edu/execsumm_pdf/11670.*

Aligning Texas Sea Grant with National Sea Grant Goals

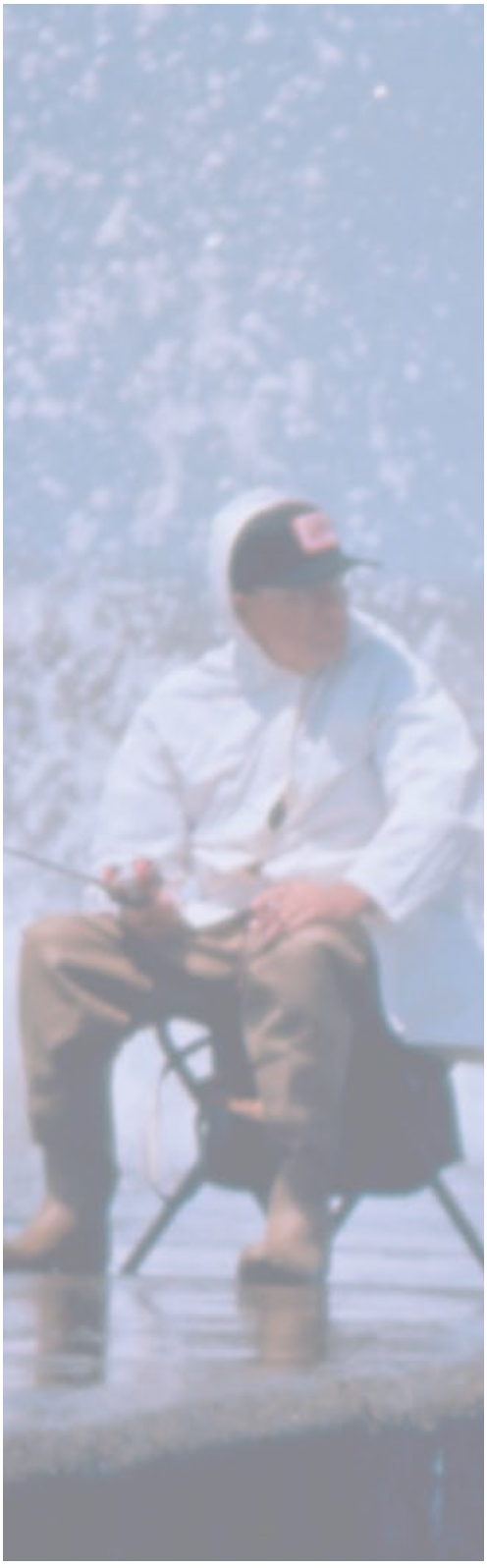
The three overarching goal areas for Texas Sea Grant that are to be addressed in this strategic plan are:

1. Coastal communities and economies.
2. Coastal ecosystem health.
3. Marine education.

The National Sea Grant College Program Strategic Plan has four focus areas. They are:

1. Healthy coastal ecosystems.
2. Sustainable coastal development.
3. Safe and sustainable seafood supply.
4. Hazard resilience in coastal communities.

Texas Sea Grant's foci and the national ones are closely aligned. Texas' coastal communities and economies focus includes sustainable coastal development and hazard resilience in coastal communities, while our coastal ecosystem health focus is basically identical to the national focus area of healthy coastal ecosystems. At the national level, marine education is built into each focus area, as is the case in Texas where education at all levels is a high priority for MIS and the Texas Sea Grant Extension Program. Virtually all research grants distributed by Texas Sea Grant provide graduate or undergraduate student support. In addition, Texas Sea Grant has a history of funding marine education research as a priority. The national focus on safe and sustainable seafood includes such topics as harmful algal blooms and contaminated marine organisms and environments. Those topics are included in the Texas plan under coastal ecosystem health. In addition, Texas Sea Grant Extension conducts HACCP training and works with the seafood industry in other ways to help improve product quality and safety.



Strategic Objectives

Texas Sea Grant has four strategic objectives.

1. Addressing Critical Issues: A long-term objective that is at the heart of the success of the program and contains a number of strategies.
2. Enhancing Products and Resources: A medium-term objective that will be accomplished as opportunity allows.
3. Engaging Stakeholders: Another medium-term objective.
4. Extending Our Reach: Strategies and goals that should be attainable in the short term (1 to 4 years).

Research, extension, communications and education strategies and goals are included under each objective.

Objective 1: Addressing Critical Issues

Texas Sea Grant's overarching long-term objective is to support research, conduct extension programs and produce materials that will substantially contribute to solving problems and addressing issues associated with coastal ecosystem health, coastal communities and economies, and ocean literacy. In working toward reaching that ultimate objective, Sea Grant will solicit proposals and/or develop extension activities and products that relate to state, regional and/or national issues, are to the extent possible under the umbrella of the National Sea Grant focus areas, or are responsive to unanticipated opportunities or issues that develop.

Strategies

During the period covered by this strategic plan, two requests for proposals will be distributed and competitions will be held. Those activities will occur in 2009 and 2011 for cycles beginning February 1, 2010, and February 1, 2012, and extending through January 31, 2012, and January 31, 2014, respectively. During these periods, research and extension activities of a priority nature in the area of addressing critical needs will include: [13, 14]

[13] *For our purposes here we include activities of both Texas Sea Grant Extension and MIS as extension functions.*

[14] *Underlined words relate the priorities to the strategic objectives.*

1. developing technologies required to produce new species for enhancement stocking and commercial aquaculture in the open ocean with an emphasis on maintaining environmental quality,
2. developing resilient, well-planned, thriving and sustainable coastal communities through studies of socio-ecological processes and innovative approaches to planning and management,
3. participating in the development of the Gulf Coastal Ocean Observing System,
4. developing informational materials on Texas coastal ecosystems and their non-market value, and supporting research to improve ecosystem-based management of fisheries and promote sustainability of the fishing industry,
5. increasing the volume while maintaining the quality of coastal and marine science information made available to the public, K-12 schools and the higher education community,
6. resolving issues related to red and brown tides, invasive species and oyster diseases, and
7. improving the quality of Texas seafood and the fuel efficiency of seafood harvesting enterprises.

Program

Strategy 1. Aquaculture[15]

(Priority = Low)

The coastal commercial aquaculture industry in Texas consists of several shrimp farms[16] and a small number of red drum production facilities. Those industries are mature and do not typically raise questions that call for research, though they do work very closely with the Sea Grant Extension Aquaculture Specialist.

Texas has a 20-year history of producing red drum for enhancement stocking in support of the recreational fishing industry (commercial capture of red drum is prohibited in Texas). Sea Grant has supported research that has been useful to the enhancement program run by the Texas Parks and Wildlife Department. Currently the department is moving into the production of spotted seatrout and flounder and is considering other species for which limited information on culture technology is available.

[15] Priorities of High, Medium or Low have been assigned to the various program elements based largely on survey information (see Tables 1 and 2, pages 8 and 9).

[16] Texas leads the nation in farmed shrimp production.

At the time of this plan's development, legislation is pending before Congress that, if enacted, will name NOAA as the lead agency for promoting and developing the regulatory and leasing programs associated with aquaculture development in the Exclusive Economic Zone (EEZ) of the United States.[17] Development of the industry in the U.S. EEZ has been limited to a few research projects to date, and research activity can be expected to expand once the industry begins to develop.

In response to the changing aquaculture landscape outlined above, Texas Sea Grant is most interested in proposals that address the topics listed in Table 4 (below). This strategy falls under the National Sea Grant focus area of: *Safe and sustainable seafood supply*.

Table 4. Research topics of interest in the area of aquaculture.

- Develop the technology required to produce additional species for enhancement stocking in coastal waters as a way of assisting with the state's fishery management program.
- Develop technology in support of open ocean aquaculture in the Gulf of Mexico.
- Ensure that the technologies are developed with the goal of producing aquatic organisms in a manner that imposes the least possible environmental impact.

[17] *NOAA released its 10-year plan for aquaculture development in November 2006. That plan can be accessed at http://www.aquaculture.noaa.gov.*

Strategy 2. Resilient Coastal Communities[18] (Priority = High)

Texas Sea Grant has been actively involved in the general area of coastal community development, primarily through research being conducted in the Houston/Galveston area that was developed by our Coastal Community Development and Environmental Quality Specialist. Hurricanes Katrina and Rita in 2005 brought increased awareness of the devastation that can occur in coastal communities from such storms. Galveston and Houston dodged a very large bullet, but the question is not if the Texas coast will experience another major hurricane, but when. The 1900 hurricane that hit Galveston led to the deaths of an estimated 10,000 people. The area from Beaumont through Houston/Galveston is now home to well over 3.5 million people.

In addition to natural hazards such as hurricanes and flooding, the Texas coast is challenged by anthropogenic hazards associated with pollution, explosions and terrorism. There is a critical need for hazards research that would characterize the factors related to community vulnerability and the vulnerability of sensitive populations. Further, work could be supported on the development of tools for decision support, planning and determination of best management practices to reduce risk and increase resilience. Specific topics of interest to Texas Sea Grant are listed in Table 5 (page 18). This strategy falls under the National Sea Grant focus area of: *Hazard resilience in coastal communities*.

[18] *This area also takes in the Urban Coast theme.*

Table 5. Research and extension topics of interest to Texas Sea Grant in the area of resilient coastal communities.

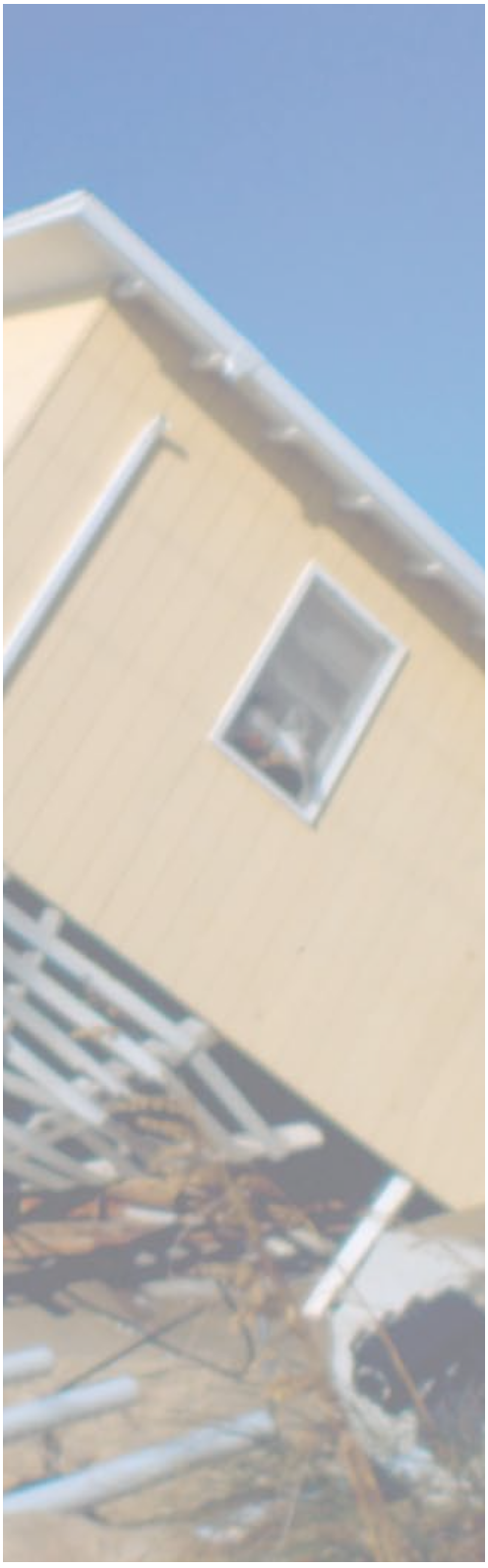
- Provide information on projected damage due to storm surges, flooding and wind damage to metropolitan areas along the coast.
- Develop a catalog of images of coastal structures (homes, businesses, factories, marinas, petrochemical plants, etc.) with GPS locations so before and after conditions can be documented following a major storm event.
- Determine methods that can be used by Sea Grant to better communicate community development and coastal hazard research in a form that is more useful to policy makers and sensitive to the public's risk perception.
- Examine the impact of population and demographic changes along the Texas coast on the state's infrastructure (economic, social and ecological systems).
- Determine the social, economic and cultural factors related to community vulnerability and the vulnerability of particular populations.
- Develop decision support tools that embody understanding of the institutional factors that facilitate coordinated, rapid response to coastal hazards.
- Develop methods to improve public access to coastal natural areas.
- Provide improved approaches to land use planning and best management practices for low impact development in support of resilient and sustainable coastal communities.
- Develop improved technologies/methods to mitigate shoreline erosion that impacts communities and critical habitats.
- Determine the benefits and impacts of new energy sources and associated infrastructure (wind, LNG terminals and pipelines) on the state.
- Determine if the impacts from increased freight imports through Texas ports can be relieved by using ships and barges in preference to trucks to transport the products inland.
- Determine how adoption by the U.S. of the Law of the Sea Convention provisions may impact the state of Texas.
- Gather information for a major article in Texas Shores to outline the effects of predicted future sea level rise on the Texas coast.
- Through the Texas Coastal Watershed Program under the leadership of the Coastal Community Development Specialist, continue to manage the Non-point Education of Municipal Officials (NEMO) program for the state.

Strategy 3. Ocean Observing

(Priority = Low)

Many organizations and individuals are concerned with sustained observations and/or products and services based on such observations obtained from the estuaries and Exclusive Economic Zone of the Gulf of Mexico. A group of these entities have signed a resolution agreeing to form the Gulf of Mexico Coastal Ocean Observing System (GCOOS), beginning with the integration of existing observing system elements and the sharing of non-commercial and non-proprietary data and products. This regional system will be a part of the U.S. sustained and Integrated Ocean Observing System (IOOS). Several components of GCOOS are currently in place in Texas. Included are the PORTS (Physical Oceanographic Real-Time System) buoys in the Houston ship channel, TABS (Texas Automated Buoy System) buoys off the coasts of Texas and Louisiana, and a series of TCOON (Texas Coastal Ocean Observation Network) tide gauge stations. Currently, Texas Sea Grant personnel are involved with the Stakeholder Council and the Education & Outreach Council of GCOOS. Sea Grant will not seek research proposals in the area of ocean observing, but will work with GCOOS in conjunction with the program's extension activities.

During the period from 2009 to 2013, Texas Sea Grant staff will work with the Stakeholder Council of GCOOS to help develop user group meetings to inform members of those groups about GCOOS and how the data generated by GCOOS will be useful to them, as well as to seek input from stakeholders about the type of information GCOOS can provide to assist them in their missions. Sea Grant will also develop and distribute information to the public through the Education & Outreach Council of GCOOS. There is no plan to develop and/or deploy sensor arrays as part of this strategy. This strategy falls under the National Sea Grant focus areas of: *Healthy coastal ecosystems* and *hazard resilience in coastal communities.*



Strategy 4. Coastal Ecosystems and Fisheries

(Priority = High)

Texas Sea Grant has emphasized research on the coastal ecosystems of the state for many years and has made significant contributions to our understanding of the diversity and functioning of the bay and estuary systems that provide important nursery grounds for many species of commercial and recreational interest, as well as providing feeding habitat and nesting grounds for certain species of sea turtles and myriad shorebirds. The fisheries theme area is included within this strategy since ecosystem-based management is aimed at commercial and recreational fisheries while considering the impacts of fishing on other components of the ecosystem. Texas Sea Grant's priority research areas in coastal ecosystems and fisheries are shown in Table 6 (page 20). This strategy falls under the National Sea Grant focus area of: *Healthy coastal ecosystems.*

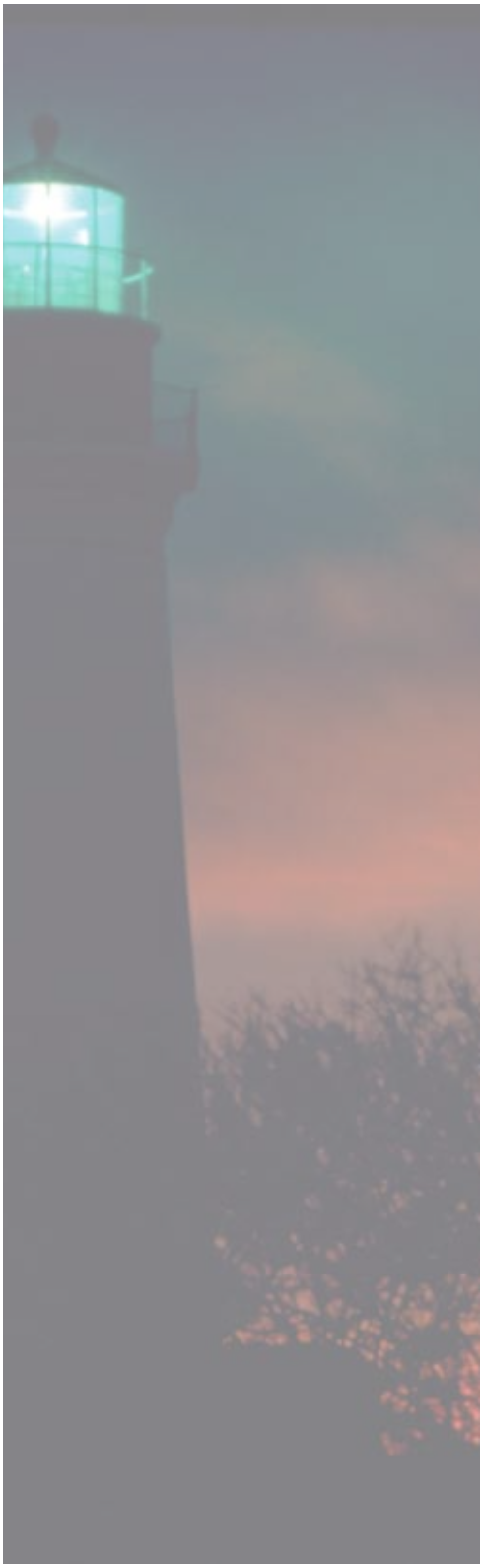


Table 6. Priorities for Texas Sea Grant in the areas of coastal ecosystems and fisheries.

- Estimate the value of coastal areas related to coastal ecological services and features contributing to heritage and nature tourism.
- Retrospectively assess an environmental impact statement (EIS) developed by the oil and gas industry several years in the past to determine how predictive the EIS was.
- Develop a research project to estimate the values (economic, social, ecological) of freshwater inflows to the coastal regions of Texas.
- Encourage research that would provide useful information to the Gulf of Mexico Fisheries Management Council and the Texas Parks and Wildlife Department as they develop ecosystem-based fishery management plans.
- Encourage other studies that relate to issues associated with the coastal ecosystems of Texas.

As part of its extension efforts, Texas Sea Grant will give priority to the following:

- Developing a partnership with the new Mission Aransas National Estuarine Research Reserve and promoting the development of research proposals that would involve the MANERR,
- Supporting wetland restoration projects and monitoring, such as the 4,500 ha Bahia Grande project in South Texas that provides a template for future restoration opportunities in Texas and the east coast of Mexico,
- Certifying as many Texas marinas as possible under the Clean Marina program, and
- Addressing issues related to protection of non-jurisdictional wetlands through improved land use planning or decision support methods.

Strategy 5. Marine Education

(Priority = High)

Texas Sea Grant has a long history of supporting research and the development of marine educational materials. The Floating Classroom Program and development of K-12 marine science curricula are examples. In addition, Texas Sea Grant strongly recommends that each grant should support at least one student (usually at the graduate level) as we do our part to train the next generation of marine scientists. Texas Sea Grant's education extension specialist is responsible for the Floating Classroom Program. A similar program operated by the Upper Texas Coast Waterborne Education Center, based in Anahuac, utilizes vessels supplied by the Chambers-Liberty Counties Navigation District. The program receives assistance from Sea Grant's Jefferson-Chambers County Agent, who is also a certified teacher.

In 2005, Texas Sea Grant took over responsibility for the National Ocean Sciences Bowl (NOSB) competition for the northern Texas region and employed a graduate student to coordinate the activity. Texas Sea Grant is also interested in participating in a COSEE (Centers for Ocean Science Education Excellence) program.

In addition to Sea Grant's continuing interest in funding at least one marine education research proposal during each cycle (see the example in Table 7, below), there are some extension activities that are goals under this strategy. They are to:

- Employ a marine educator who holds Texas teaching certification as the Texas Sea Grant marine educator, who will represent the program in the Sea Grant Educators Network at the national level, expand the program's development of K-12 curricular materials and coordinate the Dolphin Challenge, the regional NOSB competition.
- Develop a relationship with COSEE, either the Central Gulf of Mexico program or a new COSEE that could be initiated by Texas A&M University should additional opportunities for creating a center become available.

This strategy falls under the National Sea Grant cross-cutting goal of "an informed public that understands the value and vulnerability of coastal, ocean, and Great Lakes resources, and demands informed science-based decisions about the conservation, use, and management of these resources, and a well-trained workforce that will make this a reality."

Table 7. An example of the type of marine education research proposal that would be of interest to Texas Sea Grant.

• A retrospective study to determine if students who have participated in the Floating Classroom Program retain information presented during their experience on the boat and in shoreside activities and if the percentage of students pursuing additional study in and careers in math or science has increased since the schools began participating in the Floating Classroom Program.

Strategy 6. Invasive Species

(Priority = Medium)

Invasive marine species can arrive in our waters through a variety of mechanisms, including as a result of the area becoming more hospitable due to global climate change, introduction from ballast water discharge, and intentional or inadvertent releases by humans. Texas has had significant problems with the red tide events that seem to be recurring at an increasingly frequent rate in recent years. A persistent brown tide event in the Laguna Madre and invasion by brown mussels several years ago are examples of events that could recur in the future. In addressing this issue, Sea Grant would like to see proposals such as the examples in Table 8 (page 22). Relative to extension, Sea Grant will attempt to work with state agencies to

improve control and prevention of aquatic nuisance species around ports and harbors, as well as provide information to the public. This strategy falls under the National Sea Grant focus area of: *Healthy coastal ecosystems.*

Table 8. Examples of research topics in the area of marine invasive species.

- Inventory the marine invasive species of Texas and determine how that number compares with other Gulf of Mexico states and other regions of the nation and determine the rate at which new marine invasive species are being found in state waters.
- Address issues related to red tides and brown tides.
- Conduct research in conjunction with the oyster industry or on oyster diseases.[a]

[a] Funding for research on oyster diseases and working with the oyster industry should be sought through national competitions conducted by the National Sea Grant Office, as long as those programs continue to be supported at the national level.

Strategy 7. Seafood Safety and Quality

(Priority = Medium)

Red tides, oyster beds contaminated with human disease organisms, hypoxia, areas of trace metal or organic chemical contamination and other issues can affect the commercial fishing industry, tourism, human health and the Texas economy. With the commercial shrimping industry suffering from competition from imports and high fuel prices, proper handling of the product on board and value-added processing may be required if the industry is to survive. Research on contaminants and hypoxia would be supportable under the coastal ecosystem and fisheries strategy. The emphasis within Sea Grant in the area of seafood safety and quality will be through Texas Sea Grant Extension, which will:

- assist the fishing industry in implementing harvest and handling practices that lead to enhanced product quality upon delivery to processing plants,
- help the industry improve fuel efficiency in conjunction with seafood harvesting processes, and
- help the industry develop value-added products.

This strategy falls under the National Sea Grant focus areas of: *Safe and sustainable seafood supply*. This strategy would become a high research priority if sufficient expertise and interest can be developed in the state's research community.

Objective 2: Enhancing Products and Resources

Texas Sea Grant will seek innovative ways of increasing the operating budget to enhance the program's ability to fulfill its mission by seeking additional sources of funding and continuing to support increases in the national budget for Sea Grant.

Strategies

The issues facing the coastal communities and natural resources of Texas demand increasing attention and resources, yet state and federal support are not increasing at a rate that will allow Sea Grant to step up its activities. In order for us to provide enhanced products and increase the financial resources available to the program, we will concentrate on:

1. expanding the print run and readership of *Texas Shores* magazine, redesigning its appearance and format, and developing additional funding streams such as gifts or subscription fees,
2. developing an endowment for a Sea Grant chair at Texas A&M University, and
3. obtaining additional funding support for Sea Grant activities from new sources.

Program

Strategy 1. Texas Shores

(Priority = High)

A gift of $20,000 was received from Rowan Companies in 2006 in support of the publication of *Texas Shores* magazine. The gift is being used to expand the number of pages in the magazine. The editorial staff is doing a redesign and has been discussing format changes.

During the 2009-2013 period covered by this strategic plan, Texas Sea Grant will:

- strive to obtain a long-term commitment from Rowan Companies and other private entities for continued support of *Texas Shores*,
- survey the readership with respect to their willingness to pay a modest amount to receive the magazine, which is currently free to readers with Texas addresses,
- expand the number of pages in *Texas Shores*, initially by eight, reduce the length of the feature article, and include additional shorter articles of interest to readers, and

- modernize the layout of the magazine and use more eye-catching graphics.

This strategy is directly related to the National Sea Grant Strategic Plan cross-cutting goal of "an informed public that understands the value and vulnerability of coastal, ocean, and Great Lakes resources, and demands informed science-based decisions about the conservation, use, and management of these resources, and a well-trained workforce that will make this a reality."

Strategy 2. Sea Grant Chair

(Priority = Medium)

The Sea Grant Advisory Committee recommended that Sea Grant work with the College of Geosciences development officer in seeking endowed funding for a Sea Grant Chair. The position would presumably be held by the Sea Grant Director, who holds tenured faculty rank at the university. The endowment would support the Director's salary and, potentially, some travel expenses, and would represent a significant increase in the matching support for the program. During the period of this plan, the goal will be to initiate the endowment with a target of obtaining one-fourth of the required funding by the end of 2013. This strategy was one recommended by the 2004 Program Assessment Team that reviewed the Texas Sea Grant Program.

Strategy 3. Additional Support

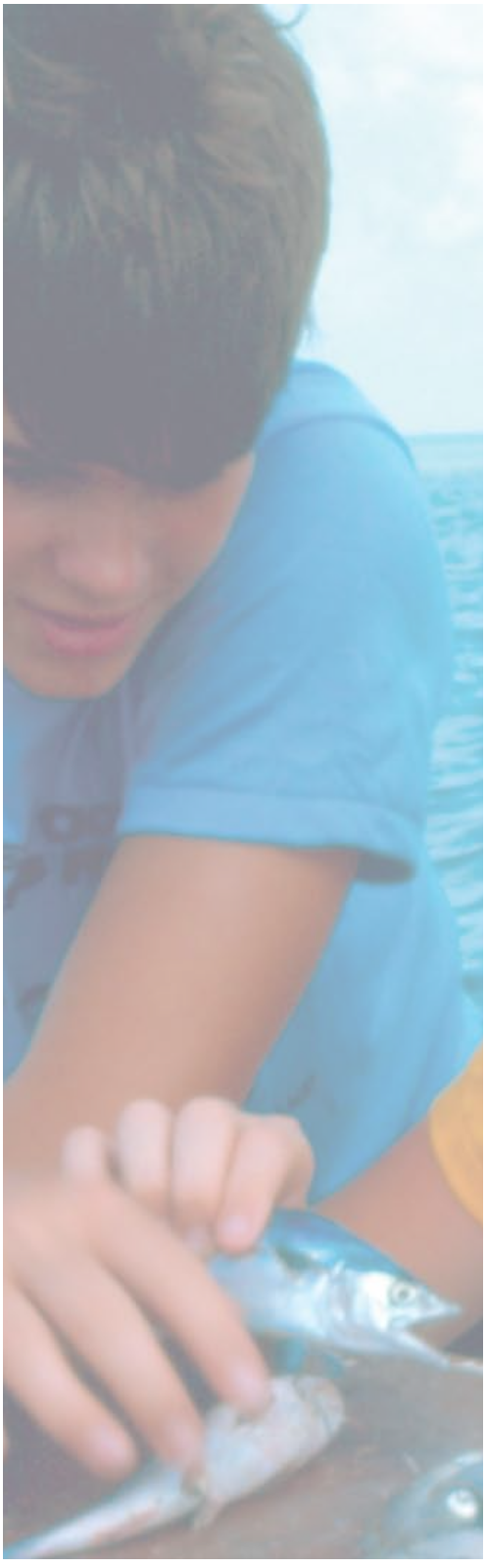
(Priority = High)

The core budget of Texas Sea Grant is supplemented in most years through funding received by Texas faculty who successfully compete for funds through the National Strategic Initiatives program operated out of the NSGO and through recipients of Knauss Fellowships. In addition, Texas is part of a regional research program for the Gulf of Mexico and the regional CI-FLOW (Coastal and Inland Flooding Observation and Warning) program. Additional funding has been obtained from NOAA and other federal agencies and departments as well as various state agencies. Furthermore, Texas Sea Grant Extension staff has continued to be successful in obtaining support funding through local and regional NGOs, state agencies and regional government organizations.

A goal for the next five years will be to further expand the sources and amounts of funding from NOAA and other sources. By the end of 2013, the target will be to increase the budget by 20 percent over the FY2006 level in non-core funds from all sources. This strategy is based on the need to expand the capabilities of Texas Sea Grant to succeed in reaching its goals.

Objective 3: Engaging Stakeholders

Texas Sea Grant plans to build and expand upon the existing relationships between our program and various state agencies and the wide variety of other stakeholders that we serve. To achieve this goal, once again Sea Grant's reputation as an honest broker of information will be one of the keys to success, as will maintenance of a highly qualified Sea Grant staff and building relationships between the university researcher communities and the stakeholder groups. This objective is aimed at expanding the impact of the state's research community by increasing collaboration and reducing duplication of effort.



Strategies

Three priority strategies will be focused on in the period from 2009 to 2013. Those involve:

1. demonstrating the effectiveness of linking university researchers with state agencies,
2. engaging the U.S. Weather Bureau and the emergency management community in selected coastal communities, and
3. developing new programs and expanding upon such existing programs as coastal community development, Clean Marinas and rip current awareness.

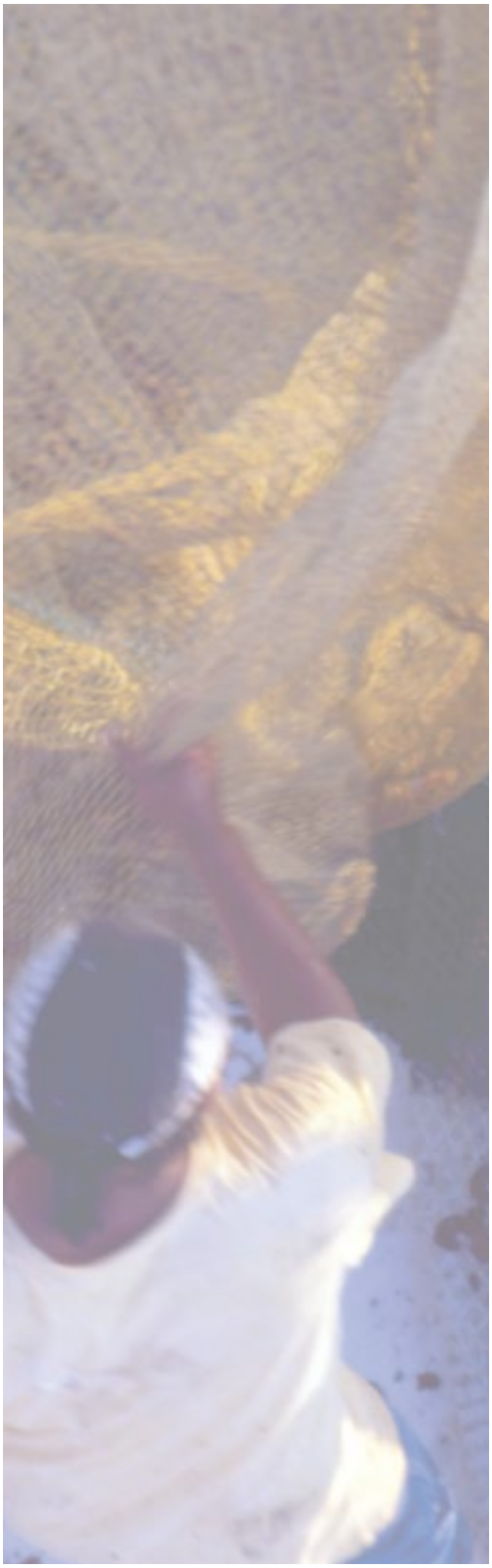
Program

Strategy 1. University Linkages

(Priority = High)

With the inclusion of the Texas Sea Grant College Program on the Coastal Coordination Council (CCC), the Texas Legislature recognized the potential of utilizing the research institutions of the state in meeting the challenges and opportunities of coastal management. The wisdom of this legislative action is realized with the ever-increasing number of applied research projects being proposed and accepted under sections 306 and 309 of the Texas Coastal Management Program (CMP) grants process.

As challenging issues continue to be recognized within the state's coastal area, decision makers will need a solid applied research base to assist in meeting the objectives of the CMP and associated management goals in the coastal area. Such a need was reflected in recent ocean policy reports, generally calling for the use of assessment, monitoring and research to provide the best available science for decision makers as well as management and policy development.



With this in mind, in 2006 Sea Grant put together a Coastal Applied Research Review Team (CARRT) comprised of individuals named by state agency research administrators and universities from across the state. The primary mission of the CARRT will be to provide counsel to the CMP grants review teams, review proposals received through solicitations from the CMP, and translate findings for use in the decision making process of the Council and other entities with jurisdiction over, or interest in, coastal issues.

The strategic goal for the near future is to activate the CARRT and make it a functional entity. Sea Grant will work with the Texas General Land Office and the CLAB (Coastal Land Advisory Board) to get the CARRT involved with reviewing CIAP (Coastal Impact Assistance Program) proposals and, if possible, proposals submitted to other agencies. Grant support for operating the CARRT is being sought through the CIAP program. The CARRT will also pay dividends to Sea Grant by providing new contacts with the upper administration at universities that have not interacted with the program in the past. This strategy falls under the National Sea Grant focus area of: *Healthy coastal ecosystems.*

Strategy 2. Engaging Weather and Emergency Personnel

(Priority = High)

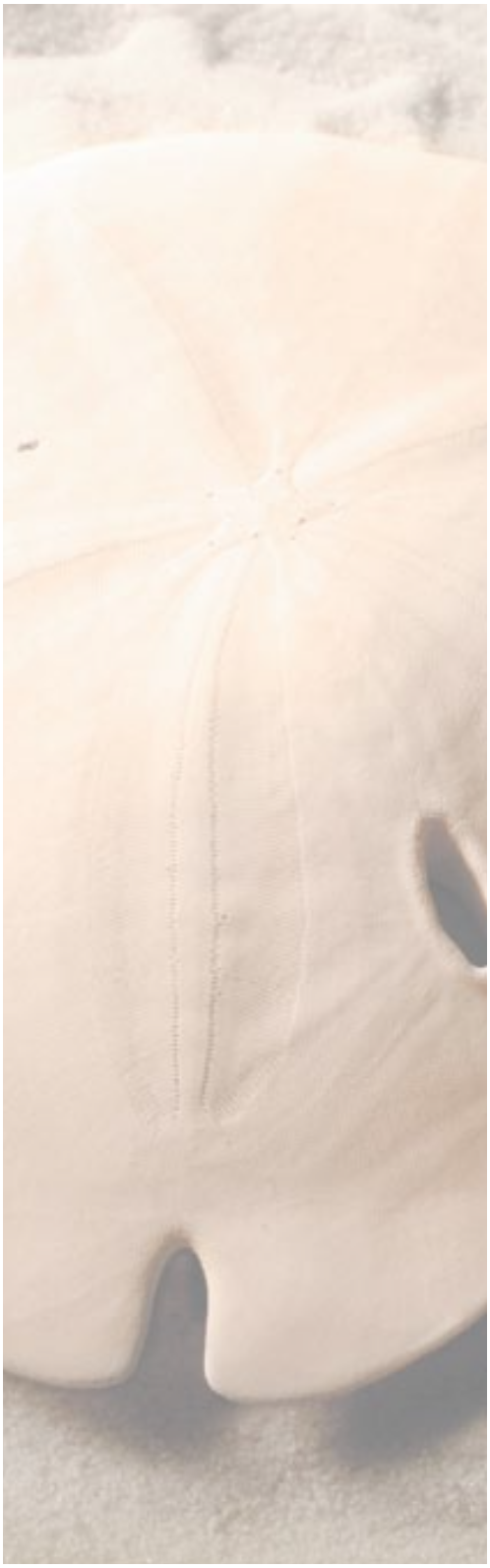
Funding has been obtained through a proposal submitted to the NSGO for funding a Sea Grant extension position at the University of Oklahoma. That individual will work with NOAA's National Severe Storms Laboratory to get precipitation models tested in selected coastal areas, including Houston/Galveston. In addition, funding has been obtained for the Sea Grant Programs in Texas, North Carolina and South Carolina to test the storm surge model (CI-FLOW) being developed at North Carolina State University. The goal during the period of this strategic plan will be to establish a relationship with appropriate Weather Bureau personnel and emergency managers in the Houston/Galveston area and encourage them to work with Sea Grant in model testing. This strategy falls under the National Sea Grant focus area of: *Hazard resilience in coastal communities.*

Strategy 3. New and Expanded Programs (Priority = High)

With the expertise available within the staff of the Texas Sea Grant College Program, new and expanded programs through our extension arm will be to:

1. assist coastal communities in efforts to protect their environmental amenities, strengthen their economies and improve their quality of life,
2. achieve a populace knowledgeable on the issues related to the coastal and marine environment, resources and enterprises,
3. achieve sustainable and economically viable fishery-related industries and enterprises,
4. achieve an economically viable and informed marine business community,
5. achieve sustainable, ecologically responsible aquaculture operations in Texas and waters adjacent to the state,
6. achieve, through applied research and technology transfer, an economically viable and sustainable seafood industry that produces, processes and markets safe, high-quality seafood products,
7. achieve balanced and effective coastal and marine policies through education and coordination with national, regional, state and local decision makers, and
8. promote responsible management of port and harbor resources through closer interaction between Sea Grant and major stakeholders in the marine transportation system.

Most of the strategies are intimately related to one or more of the focus areas that are outlined in the National Sea Grant Strategic Plan.



Objective 4: Extending Our Reach

Texas Sea Grant will work closely and in a coherent and well-planned manner with the other Sea Grant programs in the Gulf of Mexico on regional problems as a means of expanding the value of the outcomes outlined in Objective 1 beyond the state of Texas and, potentially, beyond the Gulf of Mexico region. Texas Sea Grant will also collaborate with other Sea Grant programs on problems of mutual interest where synergistic expertise exists.

Strategies

As a means of increasing the regional reach of Texas Sea Grant, priority strategies will be in:

1. developing regional research activities with colleagues in the other three Gulf Sea Grant programs, and
2. developing collaborative projects with Sea Grant programs outside of the Gulf of Mexico region.

Program

Strategy 1. Gulf Regional Programs

(Priority = High)

Texas Sea Grant and the other three Sea Grant programs in the Gulf of Mexico region have already successfully competed for a regional project that will lead to identification of the marine research being conducted in the region by universities, government and the private sector. Workshops will be held and the information will be made available throughout the region to help researchers develop new collaborations, find knowledge gaps that need to be filled, avoid duplication of effort where appropriate and develop streams of new information to Sea Grant extension and communications personnel. A goal for the coming two years will be to assist with information gathering and conduct at least one workshop in Texas.

Texas Sea Grant is also involved with a resiliency proposal funded by the Coastal Services Center (CSC). It involves TAMU-College Station, TAMU-Galveston and the Houston Advanced Research Center. Sea Grant's role will be in the area of extension activities. During the period of this strategic plan, Texas Sea Grant will continue to work with the other Gulf Sea Grant programs to develop joint research proposals, collaborate on extension activities and identify publications that can be developed for use throughout the region.

The Gulf of Mexico Sea Grant Extension programs will continue their cooperation on such issues as fisheries extension, coastal

community development, ocean observing systems, Clean Marina programs and the monofilament recovery and recycling program.

The Marine Information Service will implement a directed partnership program for eligible publications. Through the program, MIS will develop proposals for developing original publications and seek buy-in from organizations that may benefit from the products.

Strategy 2. Broader Collaborative Programs
(Priority = Moderate)

Texas Sea Grant has always worked in close cooperation with other Sea Grant programs outside of the Gulf region on a variety of activities. Examples are MarinaNet, ports and harbors issues, safety training for seamen, fishing gear development and rip current awareness. In addition, efforts are under way with coastal universities along the Gulf of Mexico, both in the U.S. and Mexico, to develop a collaboration consisting of regularly scheduled conferences and, in a focused effort with a Mexican delegate, education on the extension element at a research institution.

Finally, a collaborative effort is proposed with marine law and policy faculty at both the Harte Institute for Gulf of Mexico Studies and Texas A&M University-Galveston to establish a Gulf of Mexico Marine Law and Policy Consortium. A goal for the five years of this strategic plan will be to identify additional opportunities and further develop these new programs.

Performance Measures

Success in attaining the strategic objectives in this plan needs to be documented with appropriate metrics. Standard metrics include numbers of stakeholders served in various ways, numbers of students supported and numbers of publications produced as a result of Sea Grant-supported activities. More difficult to measure are direct economic impacts from Sea Grant research and benefits of Sea Grant activities on coastal and marine natural resources. Attempts to obtain a competitive research proposal to investigate the role of Sea Grant in the state's coastal economy have not been successful.

Additional performance metrics can only be developed once the research projects that will be supported during the 2010-2012 and 2012-2014 cycles have been selected. Those metrics will be detailed in the implementation plan that is developed following selection of the research proposals to be funded in each of the three cycles covered by this strategic plan.

Appendix

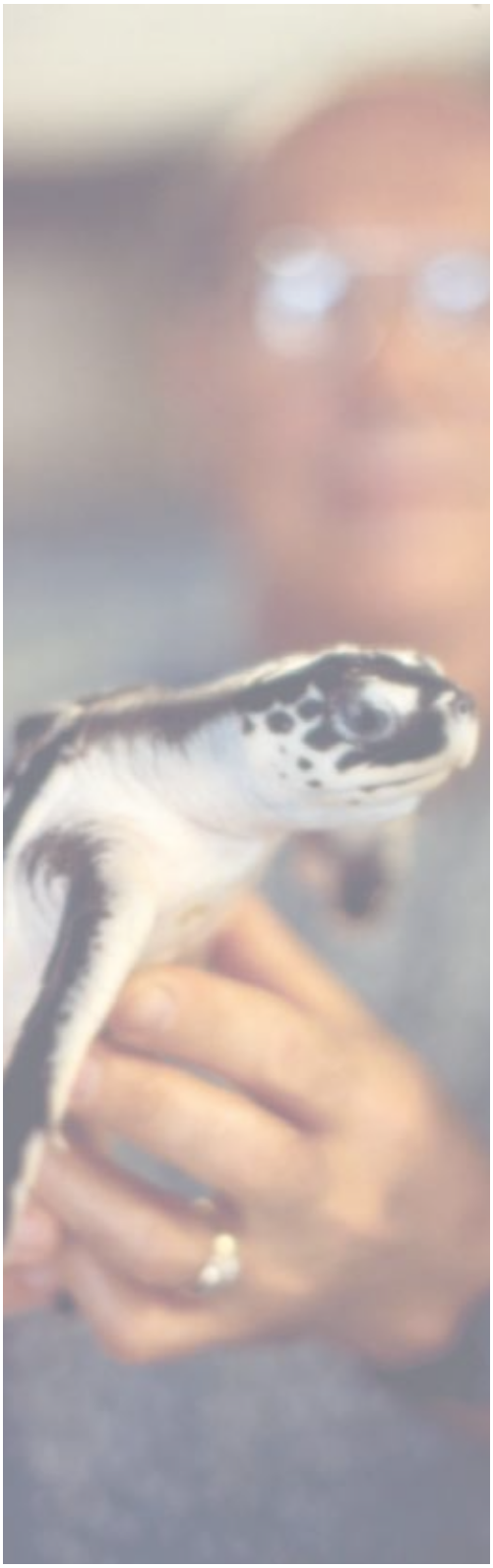
Relationships Between the Texas Sea Grant Strategic Plan and Several Other Strategic Plans and the Recommendations from Ocean Science and Policy Commissions and Other Organizations:

Vision 2020

Initiated by Texas A&M President Ray Bowen in 1977 and adopted and expanded upon by President Robert Gates, the plan consists of 13 imperatives aimed at elevating Texas A&M to a position among the top 10 universities in the United States by 2020. President Gates elected to put his initial focus on four of the original 12 imperatives and then added one of his own (Imperative 13):

- Elevate the faculty (Imperative 1)
- Improve graduate and undergraduate programs (Imperatives 2 and 3)
- Focus on diversity and globalization (Imperative 6)
- Improve space (Imperative 13)

Texas Sea Grant contributes to two of the four listed imperatives. Elevation of the stature of faculty is provided through the competitive process involved in obtaining grant support from Texas Sea Grant. Faculty whose research is supported by Sea Grant, in the majority of instances, obtain results that lead to publication in peer-reviewed journals, presentations at meetings, or other scholarly products. Sea Grant enhances the academic experience of students by providing assistantships for graduate students, in some cases paying wages for undergraduates to work on research projects, and by employing student workers who gain job experience. Significant numbers of highly qualified candidates for the Knauss Fellowship program have been identified in recent years and the success rate among those students has been exceptionally high. Additionally, the Texas Sea Grant Fellowship Program has resulted in jobs with state agencies for students interested in pursuing that career path.



NOAA's Strategic Plan

The NOAA Strategic Plan, *New Priorities for the 21st Century*, has mission goals focusing on ecosystems, climate, weather and water, and commerce and transportation. Texas Sea Grant has had and will continue to have activities in conjunction with the ecosystems mission goal through support of ecosystem and fisheries research. Past and future research activities should provide information valuable to ecosystem-based management. Support for the development of bathymetric and elevation maps of the area from the continental slope to the heads of the bays associated with Texas and Louisiana should be useful in predicting storm surges and thus tie to the weather and water mission of NOAA. A recently funded project to link Texas Sea Grant and two other Sea Grant programs with the National Severe Storms Laboratory (NSSL) in Norman, Oklahoma, should also lead to increased activity with respect to the weather and water mission. Texas Sea Grant's involvement with the Gulf Coastal Ocean Observing System provides a link with NOAA's mission in the area of commerce and transportation.

OAR's Strategic Plan

NOAA's Office of Oceanic and Atmospheric Research oversees laboratories and programs dedicated to conducting programs responsive to the NOAA priority areas of ecosystems, climate, and weather and water. Sea Grant, which is one of OAR's programs, has been associated with the ecosystem priority and specifically under the subheadings of ecosystem research, aquaculture and habitat. Texas Sea Grant supports or has supported research and other activities in each of those topical areas.

National Sea Grant Office Strategic Plan

Each state Sea Grant Program has been asked to align its strategic plan with the strategic plan developed by the National Sea Grant Office, titled *NOAA National Sea Grant College Program Strategic Plan 2009-2013: Meeting the Challenge.* Throughout the Texas Sea Grant Strategic Plan, indications as to how that alignment exists are pointed out with respect to the various goals and strategies.

U.S. Commission on Ocean Policy

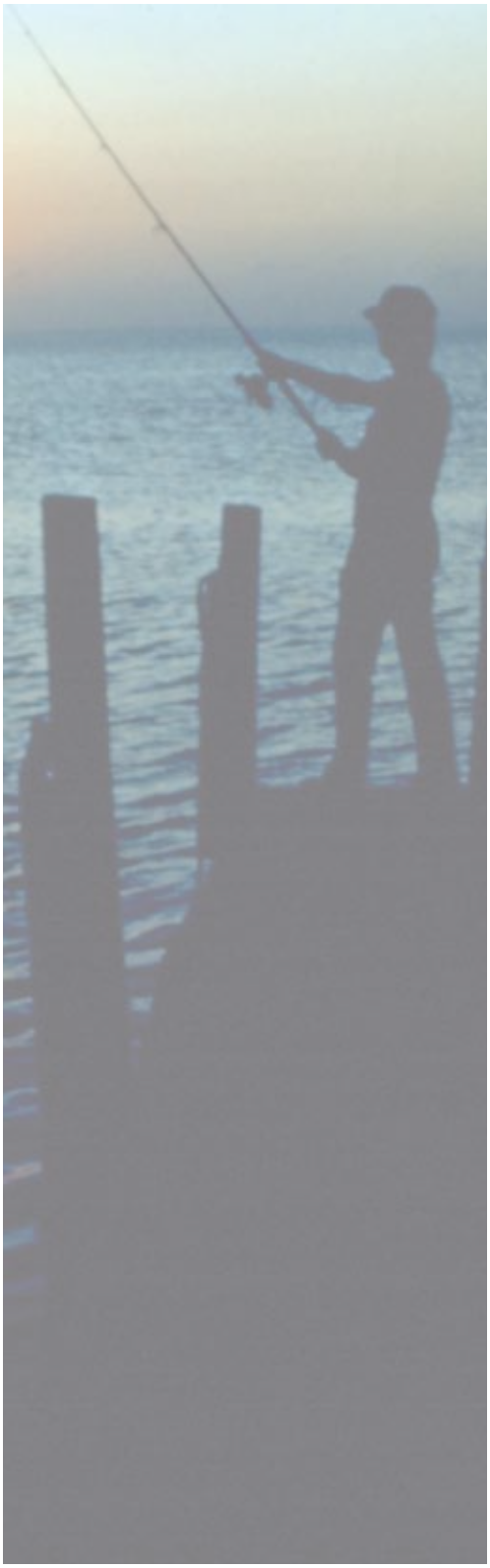
Sea Grant is mentioned specifically some 50 times in the Commission's report. There were about 200 recommendations in the report, many of them focused on topics that have been incorporated into Texas Sea Grant's portfolio over the past several years. Included are research, extension and/or education activities associated with enhancing science literacy, coastal planning and management, natural hazards, restoration science, wetlands management, sediment and dredge material movement and management, water quality, pollution, ocean observing, vessel pollution, invasive and noxious marine species, fisheries sustainability and ecosystem-based management, endangered species, sustainable marine aquaculture and oceans and human health. It was specifically recommended (Recommendation 8-6) that the National Sea Grant Program should increase the proportion of its resources dedicated to ocean and coastal education.

U.S. Ocean Action Plan

The plan was drafted in response to the report of the U.S. Commission on Ocean Policy. It proposed, among other things, establishment of a cabinet-level Committee on Ocean Policy. Included was the goal of building a global observing network and supporting a regional partnership in the Gulf of Mexico. Texas Sea Grant is involved in the Gulf Coastal Ocean Observing System (GCOOS), which is a part of the Global Ocean Observing System (GOOS) and is committed to working with the Gulf of Mexico Alliance, which was formed in response to the goal of developing a Gulf of Mexico regional partnership.

Joint Ocean Commission Initiative

The initiative identifies the major issues that need to be addressed to begin implementing the recommendations of the U.S. Commission on Ocean Policy and the report from the Pew Oceans Commission, *America's Living Oceans*.[19] Many of the actions recommended deal with legislation, some of which would support activities with which Texas Sea Grant is involved. Included are funding for GOOS, moving toward ecosystem-based management and increasing support for public education related to ocean issues.



[19] *http://www.pewtrusts.com/pdf/env_pew_oceans_final_report.pdf.*

JSOST National Research Priorities Plan

The JSOST plan calls for research that would focus on the following research areas:

- Stewardship of our Natural and Cultural Ocean Resources
- Increasing Resilience to Natural Hazards
- Enabling Marine Operations
- The Ocean's Role in Climate
- Improving Ecosystem Health
- Enhancing Human Health

Texas Sea Grant has been involved and continues to have interest in five of the six focus areas. To mention but a few examples, we have an active and continuously developing program in coastal community development that fits within the stewardship area. We are also involved in ocean observing, particularly from the standpoint of extension. Natural hazards are of particular interest with respect to beach erosion, protection of human life, and our recent involvement in storm surge prediction, all related to hurricanes and tropical storm events. Texas Sea Grant has had ecosystem health as a priority for several years, and enhancing human health is addressed through our work on aquatic nuisance species such as red tides and brown tides. The only focus area in which Texas Sea Grant is not currently involved is climate.

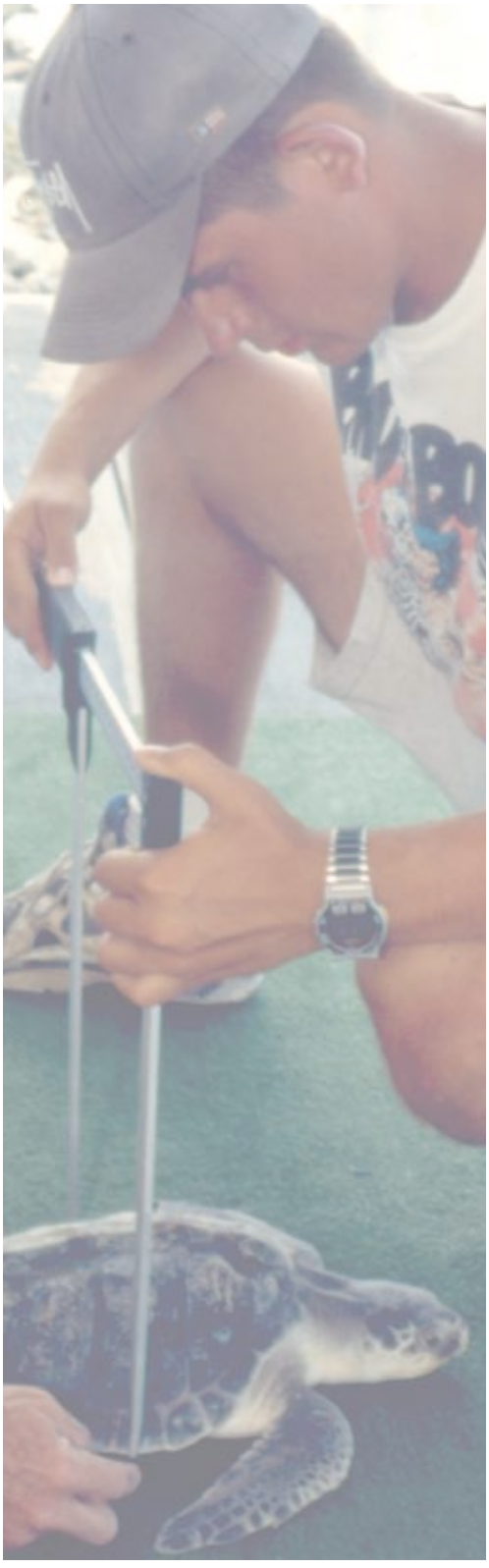
Governors' Action Plan

The Gulf of Mexico Alliance action plan deals with five issues of regional significance. They are:

- water quality for healthy beaches and shellfish beds,
- wetland and coastal conservation and restoration,
- environmental education,
- identification and characterization of Gulf habitats, and
- reductions in nutrient inputs to coastal ecosystems.

Texas Sea Grant has ongoing or past research and/or extension and education programs in each of the five issue areas, as do the other Sea Grant programs in the Gulf region. All the Gulf Sea Grant Programs currently have regional research funding to identify all the marine research efforts currently under way in the Gulf region with the goal of building partnerships among agencies, academic institutions, NGOs and the private sector that will strengthen the ability of researchers to form interdisciplinary teams and find the resources required to address and resolve the many issues that exist along the Gulf coast with respect to natural resources, the environment and coastal communities.

Notes



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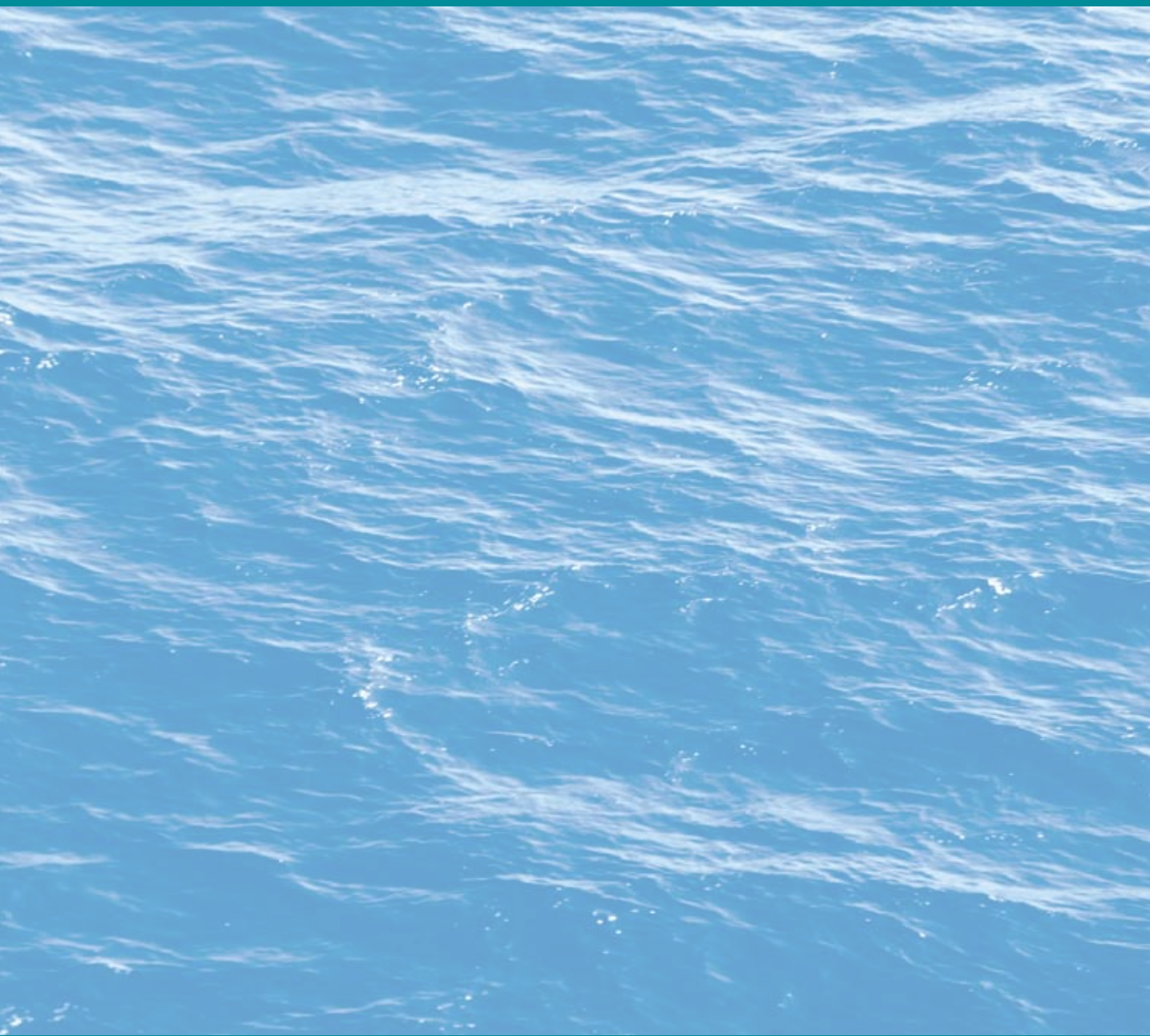

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